



## Our 8<sup>th</sup> month! Electrical code issues and answers.

### ● Expansion joints in rigid nonmetallic conduit

Like all construction materials, rigid nonmetallic conduit will expand or contract with variations in temperatures. NEC 347-9 requires that expansion fittings *"shall be provided to compensate for thermal expansion and contraction where the length change, in accordance with the tables in Chapter 9, is expected to be greater than 0.25 in. (6.36mm) or greater in a straight run installed between securely mounted items such as boxes, cabinets, elbows, or other conduit terminations."* Conduit manufacturers may also require that up to 30 degrees temperature change be added when the installation is made in an area exposed to direct sunlight.

Example: A 10-foot straight length of conduit is installed between two junction boxes; the geographical area reaches a low temperature of 15°F in the Winter and a high of 95°F in the Summer; the conduit run is on the south side of the building and exposed to direct sunlight. The proper calculation is as follows:

Summer high (95°F) minus winter low (15°F) is a difference of 80 degrees. Since the conduit is exposed to direct sunlight, add an additional 30 degrees for radiant heating effects. The result is a 110 degree total temperature differential. Table 10 in Chapter 9 indicates a 100-foot run of conduit will change 4.5 in. The 10-foot length is 10% of the 100-ft. length found in the table. Therefore it will change 10% of 4.5 in. or 0.45 in. Since this length change is greater than 0.25 in. an expansion fitting is required. It should be noted that installation methods that allow for movement of the conduit relative to fixed parts of the system might adequately provide for expansion and contraction without damage.

### ● Disconnects for on-site sewage disposal systems

The disconnecting means for on-site septic system controllers and motors must meet all applicable requirements of the NEC and WAC 296-46-50002. NEC 430-102 requires a disconnect to be *"located in sight from"* both the controller location and the motor location, except when the disconnect that is in sight from the controller location is capable of being locked in the open position. NEC 430-107 requires that *"one of the disconnecting means shall be readily accessible."* NEC 380-3 requires that switches and circuit breakers be of the externally operable type. Article 100 of the NEC defines externally operable as: *"Capable of being operated without exposing the operator to contact with live parts."*

A circuit breaker contained in a pump control enclosure that has a cover secured by screws, or has no dead front within to protect personnel from exposure to live parts, does not comply with NEC 430-107 or NEC 380-3. In such cases a separate disconnect switch is required. Where there is no control enclosure and line voltage float switches function as the motor controller, a disconnecting means *"in sight"* from the tank access is required.

### ● Setting up contractor accounts

#### What is a contractor deposit account?

Contractor deposit is an account that the Department of Labor and Industries will set up for any electrical or construction contractor who is licensed or registered in the Contractor Registration Information System (CRIS) database.

#### How does this account work?

A contractor may deposit money into this account at any time. The contractor's license number will also be their account number. This account will allow contractors to pay for transactions including electrical permits and licensing fees without sending a check or walking the money into the local L & I office.

#### What type of account is it?

The account is a non-interest bearing account that is not protected from any legally acquired liens or attachments. Each transaction requires authorization from the contractor or his agent. In the case of an Electrical Work Permit Application the signature on the permit will meet this requirement. A monthly statement will be sent to the contractor showing all account activity.

**How is an account set up?**

An account may be set up by contacting the support staff at the nearest Department of Labor and Industries service location and providing written authorization to set up the account. It is recommended, but not required that an amount equal to the anticipated monthly activity be deposited.

**● Pool panels in detached buildings**

A reply to the following question has been requested. Is a feeder to a swimming pool panel in a detached building required to have an insulated equipment grounding conductor installed in a raceway as per NEC 680-25(d)?

The 1998 National Electrical Code Committee Report on Proposals and Report on Comments (for the 1999 NEC) publications have revised Article 680-25(d). The latest revision from the ROC (comment 20-130) explains the intention of the code panel and reads as follows:

*“680-25(d) Panelboards. A panelboard and, where installed, a disconnecting means, that are not part of the service equipment or source of a separately derived system, shall have an equipment grounding conductor installed between its grounding terminal and the grounding terminal of the applicable service equipment or source of a separately derived system. This conductor shall be sized in accordance with Table 250-122 but not smaller than No. 12. On separately derived systems, this conductor shall be sized in accordance with Table 250-66 but not smaller than No. 8. It shall be an insulated conductor and shall be installed with the feeder conductors in rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit. Electrical metallic tubing shall be permitted to be used to protect conductors where installed on or within the building in accordance with Article 344. Electrical nonmetallic tubing shall be permitted to be used to enclose the conductors where installed within the building in accordance with Article 344. The equipment grounding conductor shall be connected to an equipment grounding terminal of the panelboard and, where installed, to the enclosure for a disconnecting means.*

*(1) Where the equipment grounding conductor between an existing remote panelboard and the service equipment is connected by means of a flexible metal conduit or an approved cable assembly with an insulated or covered equipment grounding conductor, the conduits listed above shall not be required.*

*(2) A panelboard at a separate building shall be permitted to supply swimming pool equipment if the feeder meets the requirements for grounding in Section 250-32. Where installed, an equipment grounding conductor shall be an insulated conductor.”*

It should be noted that the reference to NEC 250-32 in section (2) above is for the re-numbered article 250 in the 1999 NEC. This section was numbered NEC 250-24 in the 1996 code. Also, section 250-32 (1999 NEC) will require an equipment grounding conductor in the feeder when there are any continuous metallic paths between both buildings.

Where NEC 250-24 (1996 NEC) allows a feeder without an equipment grounding conductor, an insulated equipment grounding conductor in raceway to a swimming pool panel is not required. However, if an equipment grounding conductor is installed between the service and a swimming pool panel in a detached building it must be insulated and installed according to the wiring method requirements of NEC 680-25(d).

**● Electrical permits purchased marked “ready now”**

As the result of an audit, the “ready now” box at the top of the Electrical Work Permit Application form was removed. The auditors determined that if “ready now” was marked the applicant was in violation of WAC 296-46-495(2). This rule requires electrical work permits be obtained prior to beginning installations or alterations. Customer service personnel were instructed not to process these permits.

When purchasing an electrical permit, it is acceptable to note a future date when the permit will be ready, but permits cannot be marked “ready now”.

**● Panelboards installed in stairwells**

Panelboards may be installed in stairwells provided they are in compliance with all applicable requirements of the NEC and WAC 296-46. There is no specific requirement for a level working platform, however proper working clearances (NEC 110-16) and maximum disconnect height (NEC 380-8) must be complied with. It is possible that the installation could be judged to be unsafe by the inspector due to a steep pitch of the stairway or other site conditions. Questionable installations should be discussed with the local inspector prior to beginning the work.